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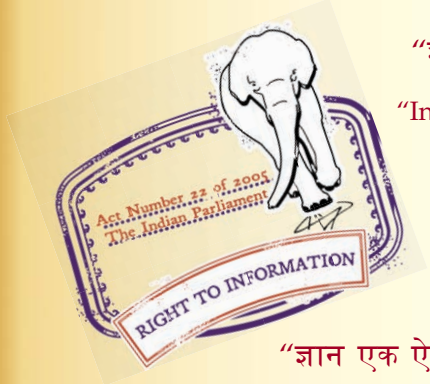
IS 3397 (1978): Specification for Community Radio Receiveers [LITD 12: Transmitting Equipment for Radio Communication]



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"Knowledge is such a treasure which cannot be stolen"

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IS : 3397 - 1978
(Superseding IS : 706 - 1955)
(Reaffirmed 2003)

Indian Standard

SPECIFICATION FOR COMMUNITY RADIO RECEIVERS

(First Revision)

UDC 621·396·62

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

August 1978

IS : 3397 - 1978
(Superseding IS : 706 - 1955)

Indian Standard

SPECIFICATION FOR COMMUNITY RADIO RECEIVERS

(First Revision)

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Indian Standard

SPECIFICATION FOR COMMUNITY RADIO RECEIVERS

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 11 January 1978, after the draft finalized by the Radio Communications Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

0.2 Community radio receivers were covered in four Indian Standards, namely, IS:705-1955*, IS:706-1955†, IS:1036-1957‡ and IS:3397-1966§, depending upon the design and power supply requirements. At present only mains operated or dry battery operated community radio receivers are being manufactured. The community radio receivers employing electron tubes and operating from battery packs have become obsolete. Taking these developments into account, it has been decided:

a) to combine the specifications of ac mains operated community radio receivers (IS:706-1955†) and dry battery operated community radio receivers utilizing transistors (IS:3397-1966§), in a single standard;

b) to withdraw IS:705-1955* which is considered obsolete since these receivers employing electron tubes and operating from battery packs are no longer made in this country; and

c) to withdraw IS:1036-1957‡ since dry battery version is preferred to accumulator battery operated version.

0.2.1 This standard would therefore cover the ac mains operated community radio receivers and dry battery operated community radio receivers utilizing transistors, intended for reception of amplitude modulated broadcast transmission.

*Specification for dry battery operated community radio receivers.

†Specification for ac mains-operated community radio receivers.

‡Specification for 6 volt accumulator-operated community radio receivers.

§Specification for dry battery operated community radio receivers utilizing transistors.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the results of a test, shall be rounded off in accordance with IS:2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the environmental, electrical and other performance requirements for community radio receivers intended for reception of amplitude modulation broadcast transmissions.

1.2 This standard covers both medium wave and combined medium wave and short wave receivers.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions and explanations of terms given in IS:614-1964† shall apply, in addition to the following.

2.1.1 *Type Tests* — Tests carried out to prove conformity with the requirements of this standard. These are intended to prove the general quality and design of a particular type of community radio receiver.

2.1.2 *Acceptance Tests* — Tests carried out on samples of community radio receivers selected from a lot for the purpose of acceptance of the lot.

2.1.2.1 *Lot* — All community radio receivers of the same type having the same design (for example, same frequency range, output impedances and power supply requirements); manufactured by the same technique under essentially similar conditions of production.

2.1.3 *Routine Tests* — Tests carried out on each community radio receiver to check the requirements which are likely to vary during production.

3. GENERAL REQUIREMENTS

3.1 Materials, Components and Workmanship

3.1.1 All materials and components used in the manufacture of the receiver shall be most suitable for the purpose. The components used in the receiver shall conform to the appropriate grades of the relevant Indian Standards, wherever they exist.

3.1.2 Workmanship shall be in accordance with good engineering practice.

*Rules for rounding off numerical values (*revised*).

†Methods of measurements on receivers for amplitude modulation broadcast transmission (*revised*).

3.2 Loudspeakers — The loudspeakers used with community radio receivers shall conform to IS:7741 (Part IV)-1977*. The loudspeaker shall not be contained in the cabinet and shall form a separate unit.

3.3 Mechanical Strength of Complete Receiver — The receiver shall have adequate mechanical strength. It shall not show any sign of damage when subjected to the bump test in accordance with **10.2.5**.

4. MECHANICAL REQUIREMENTS

4.1 Interchangeability — The cabinet and chassis of similar receivers shall be readily interchangeable.

4.2 Cabinet

4.2.1 *Overall Dimensions* — The overall dimensions of the cabinet shall not exceed the following:

Length — 430 mm

Height — 250 mm

Depth — 230 mm

4.2.2 *Construction* — The cabinet shall be rigid in construction and made out of mild steel sheet 1·25 mm or thicker. The design shall be such as to afford reasonable protection from dust to the receiver and its component parts. The cabinet shall be provided with four feet made of rubber or other suitable material and shall be portable through the provision of a single, durable and collapsible handle made of leather or polyvinyl chloride. The back cover shall be attached to the cabinet by captive type of screws.

4.2.2.1 *Projecting Metal Parts* — Except the lead-seal, handle and feet, no part shall project outside the cabinet by more than 6 mm and none of the projecting parts shall have sharp edges.

4.2.3 *Finish* — The cabinet shall be given a suitable anticorrosion pretreatment and painted with one coat of a suitable primer and two coats of finish paints and stoved. It shall be finished smooth in light grey, conforming to colour No. 631 of IS:5-1961†.

4.2.4 *Accessibility Through the Cabinet* — The cabinet shall incorporate features to provide:

a) accessibility through a lead-seal to the receiver chassis, components and controls except as provided for under (b); and

b) accessibility, without the lead-seal, to the following parts:

1) Aerial, earth and loudspeaker terminals;

2) Volume control and on/off switch;

*Specification for loudspeakers: Part IV Loudspeakers for community radio receivers.
†Colours of ready mixed paints (*revised*).

3) Band change switch in the combined model (*see* **7.2.2**);

4) Fine tuning control; and

5) Battery cable and plug (s).

4.2.5 *Location of Terminals* — The aerial, earth and loudspeaker terminals (which shall be of the screw type) shall be located at the rear of the cabinet.

4.2.6 *Supply Cable* — Provision shall be made in the cabinet for securely retaining the power supply cable and plug inside it during the transport of the receiver. The cable shall emerge from the rear of the cabinet when required.

4.3 *Chassis*

4.3.1 The chassis shall be made out of mild steel sheet 1·25 mm or thicker, and cadmium plated to a thickness of not less than 0·01 mm and passivated. It shall be capable of being fitted securely inside the cabinet. The construction of the chassis shall be such as to permit its removal from the cabinet, without the use of special tools, for inspection and service.

4.3.2 *U-Brackets* — Receiver chassis shall be provided with U-brackets fitted on bottom as well as on top on either end of the chassis to facilitate easy servicing and also to provide adequate protection to delicate components while resting the receiver chassis. The steel strip used for the U-brackets shall be at least 3·2 mm in thickness and 19·0 mm in width.

4.3.3 All mechanical parts made of steel, such as brackets and mounting plates, shall be cadmium plated to a thickness of not less than 0·01 mm and passivated.

4.4 Layout of Components

4.4.1 The layout of components, wiring and soldering shall conform to good engineering practice. Heavy components such as output and driver transformers shall be firmly bolted to the chassis and secured in position by the use of spring washers or lock-nuts.

4.4.2 Each control knob shall have a metal bushing and shall be securely fixed by means of a single grub screw. Each knob shall be able to withstand the application of a torque of 1 Nm. The shaft shall have a seating suitable for the type of screw used.

5. SAFETY

5.1 Receivers operating from electric mains shall conform to the relevant requirements of IS:616-1957*.

*Code of safety requirements for mains-operated radio receivers.

6. POWER SUPPLY REQUIREMENTS

6.1 Power Supply — The receiver shall be designed for operation from any of the following source of supply:

a) Mains supply with a nominal supply voltage of 240V ac single phase 50 Hz;

b) 9V primary batteries of 6F 100/6 conforming to IS:2576-1975*; and

c) Mains supply-cum-battery operation.

NOTE — The changeover from mains to battery in case of failure of mains supply and back to mains on restoration of supply shall be automatic by means of suitable relay arrangement.

6.1.1 The battery shall be contained within the receiver itself. It shall be possible to replace the battery without dismantling the receiver.

6.1.2 The receiver designed for battery operation only [*see* **6.1** (b)] may be capable of operating from mains supply through an external battery eliminator.

6.1.3 The battery operated receiver shall be provided with a suitable plug for being connected to the specified battery (6F 100/6 of IS:2576-1975*).

7. PERFORMANCE REQUIREMENTS

7.1 Measurement of Performance

7.1.1 General test conditions and methods of measurements of electrical performance characteristics specified shall be in accordance with IS:614-1964†.

7.1.2 The performance requirements specified in this standard refer to normal operating voltage in case of mains operated receivers (*see* **3.1** of IS:614-1964†) and to reduced voltage operation in case of battery operation (*see* **3.4.4** of IS:614-1964†).

7.1.2.1 *Modulation Frequency* — For the purpose of tests, the modulation frequency shall be 1000 Hz.

7.2 Frequency Ranges

7.2.1 *Medium Wave Receiver* — The medium wave model shall be designed to receive broadcast transmissions in the frequency range from 525 to 1605 kHz and shall be capable of being coarse pretuned to any spot frequency in that range.

*Specification for dry batteries for transistor radio receivers.

†Methods of measurements on receivers for amplitude modulation broadcast transmission (*revised*).

7.2.2 *Combined Medium Wave and Short Wave Receiver*

7.2.2.1 The receiver shall be designed to receive broadcast transmissions in the following frequency ranges:

a) Medium wave band — 525-1605 kHz

b) Short wave bands:

1) 9 500-9 775 kHz (31 meter band)
2) 7 100-7 300 „ (41 „ „)
3) 5 950-6 200 „ (49 „ „)
4) 4 750-5 060 „ (60 „ „)
5) 3 200-3 400 „ (90 „ „)

7.2.2.2 It shall be capable of being coarse pretuned to:

a) Any spot frequency in the medium wave band, and

b) any spot frequency in each of the five short wave bands specified under **7.2.2.1** (b). Normally three out of five short wave bands shall be made available for ready selection at one time to the operator, the remaining being muted by such means as are available through the lead-seal specified under **4.2.4** (a) but are simple enough to effect easily an interchange with any of the available ones.

7.2.3 The arrangement for presetting the receiver to the desired frequency or frequencies shall be available only to the technical personnel and not to the daily operational staff. In the case of combined MW/SW model a band change switch shall be provided to enable the operational staff to select any of the available frequencies.

NOTE — The band changes shall be effected by simple and easy means not involving use of soldering iron.

7.3 Fine Tuning Control — A fine tuning control shall be provided to facilitate accurate setting to the desired frequency and to compensate for any frequency drift during operation. The variation in frequency affected by the fine tuning control shall be not less than ± 6 kHz and not more than ± 10 kHz from the desired frequency on all the frequency ranges.

7.4 Intermediate Frequency — The nominal intermediate frequency shall be 455 kHz.

7.5 Output Impedance

7.5.1 The receiver shall be provided with output impedances of 8 ohms and 16 ohms.

7.6 Drift

7.6.1 *Due to Mains/Battery Voltage* — The drift due to variation of mains voltage by ±10 percent or battery voltage from normal to reduced voltage, in the frequency to which the receiver is tuned shall not exceed ±1.5 kHz in all the frequency ranges covered by the receiver.

7.6.2 *Due to Variation in Input Signal* — The drift due to variation in the input signal level, in the frequency to which the receiver is tuned, shall not exceed ±1·5 kHz during measurements of AGC figure of merit (*see* **7.8**).

7.7 Noise Limited Sensitivity — The figure for noise limited sensitivity of the receiver at a signal to noise ratio of not less than 20 dB and when measured in accordance with **4.2** of IS:614-1964* shall not exceed the value of 100 μV in all the bands at normal as well as reduced battery voltages.

7.8 AGC Figure of Merit — The AGC figure of merit shall be such that its range is not less than 30 dB starting from an upper limit of 5 mV for the input signal.

7.9 Overload Distortion — The overload distortion with AGC operating shall be less than 10 percent up to a 50 mV input signal (modulated 30 percent at 1 000 Hz), the tuning being carried out for minimum distortion and the volume control adjusted for rated maximum useful output power.

7.10 Selectivity — The selectivity of the receiver measured in accordance with **4.5** of IS:614-1964* shall be not less than 18 dB and 36 dB at ±9 kHz and ±18 kHz off resonance respectively.

7.11 IF Interference — The intermediate frequency interference ratio determined in accordance with **4.7** of IS:614-1964* shall be not less than 20 dB in the medium wave band and not less than 30 dB in short wave bands.

7.12 Image Ratio — The image ratio measured in accordance with **4.8** of IS:614-1964* shall be not less than 30 dB in medium wave band and not less than 15 dB in short wave bands.

7.13 Electrical Frequency Characteristic — The maximum variation in response in the frequency range from 100 Hz to 4 kHz measured in accordance with **4.10** of IS:614-1964* shall not exceed 8 dB, the reference frequency being 1 000 Hz.

7.14 Maximum Useful Output Power — The maximum useful output power determined in accordance with **4.13** of IS:614-1964* shall be not less than 800 mW at normal voltage and not less than 400 mW at reduced voltage in the case of battery operation and shall be available under conditions of operation with maximum ambient temperatures not exceeding 45°C.

*Methods of measurements on receivers for amplitude modulation broadcast transmissions (*revised*).

7.15 Battery Drain — The battery drain at normal voltage shall not exceed the following limits at 27±2°C.

	Battery Drain, Max
At zero signal	230 mA
When delivering maximum output power	240 mA

7.16 Performance Under Impulse Excitation Conditions — With the receiver tuned to 1 MHz, an input from a signal generator (at 1 MHz and at a level of 5 mV) modulated 100 percent by a squarewave signal shall be applied. Under these conditions there shall be no sustained oscillation.

7.17 Interference Requirements by Two Signal Generator Method — Under consideration.

8. MARKING AND PACKING

8.1 Marking

8.1.1 The model and serial number of the receiver shall be marked indelibly on the chassis.

8.1.2 The following markings shall appear on the cabinet:

a) Name of the manufacturer and country of origin;

b) Letters, in appropriate places, to indicate the position of volume control and on/off switch, fine tuning control and band change switch;

c) Graphical symbols to indicate the aerial [*see* IS:2032 (Part XVI)-1972*] and loudspeaker [*see* IS:2032 (Part XII)-1969†] terminals (in addition to symbols, letter markings may also be given);

d) Power supply requirements for which the receiver is designed;

e) Any other information or caution which the manufacturer considers necessary.

8.1.3 The receivers may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

*Graphical symbols used in electrotechnology: Part XVI Aerials

†Graphical symbols used in electrotechnology: Part XII Electro-acoustic transducers and recording and reproducing systems.

8.2 Packing

8.2.1 Each receiver shall be put into a corrugated paper box and shall be packed in a wooden box suitable to withstand normal handling and transport conditions. The wooden box containing the cardboard packings should also be lined to a depth of 5 cm on all sides with suitable packing materials.

8.2.1.1 The corrugated paper box containing the individual receiver should have at least 2·5 cm space all round when the receiver is placed in it and this space should be filled with corrugated paper packing.

NOTE 1 — Packing shall be such that no damage occurs during transport and handling. The packages should be prominently labelled indicating the fragile nature of the contents.

NOTE 2 — Instructions for careful handling should be prominently displayed on the packages in order to avoid damages in transit over difficult terrain and remote hilly areas.

9. INSTRUCTION LEAFLET

9.1 A copy of the operating instructions shall be supplied with each receiver.

9.2 Leaflets containing information relating to installation, servicing and maintenance along with circuit diagram and layout of components, shall be made available.

10. TESTS

10.1 Classification of Tests

10.1.1 *Type Tests* — The tests should include checking conformity with the following:

a) General and mechanical requirements specified in **3** and **4**,

b) Marking and packing requirements specified in **8**,

c) Safety requirement specified in **5**,

d) Power supply requirements specified in **6**, and

e) Performance requirements specified in **7**.

10.1.1.1 Unless otherwise specified, the number of samples for type tests shall be three. The manufacturer shall send to the testing authority samples of the receiver together with relevant technical data and drawings as desired by the testing authority.

NOTE — Such information furnished by the manufacturer shall be treated as confidential and shall not be divulged to any one by the testing authority without the written permission of the manufacturer.

10.1.1.2 *Criteria for approval* — The samples shall be tested for compliance with the requirements of this standard and if found satisfactory, an approval certificate shall be issued by the testing authority. Any subsequent change in the design, construction or materials used in a receiver of approved type shall be brought to the notice of the testing authority, who may, in their discretion, call for fresh samples embodying such changes.

10.1.2 *Acceptance Tests* — The following shall constitute the acceptance tests:

a) Noise limited sensitivity,

b) Selectivity,

c) Maximum useful output power,

d) Electrical frequency characteristic, and

e) Battery drain.

10.1.2.1 Samples shall be selected and subjected to acceptance tests to ascertain the conformity of each lot to the requirement specified. A recommended sampling plan and acceptance criteria is given in Appendix A.

10.2 Environmental Tests

10.2.1 *Initial Measurements* — The following initial measurements shall be made before carrying out the environmental tests:

a) Noise limited sensitivity,

b) Frequency stability, and

c) Maximum useful output power.

10.2.2 *Dry Heat* — The receivers shall be subjected to dry heat test of severity 55°C carried out in accordance with IS:2106 (Part IV)-1963*.

After the conditioning, the receiver shall be subjected to the recovery under standard atmospheric conditions for testing for a period of two hours. The final measurements as specified in **10.2.6** shall be made. The receiver shall conform to the applicable performance requirements specified in **7**.

10.2.3 *Damp Heat (Cycling)* — The receiver shall withstand two cycles of damp heat test, carried out in accordance with IS:2106 (Part II)-1962†.

After the conditioning, the receiver shall be subjected to the recovery under standard atmospheric conditions for testing for a period of two hours. The final measurements as specified in **10.2.6** shall be made. The receiver shall conform to the applicable performance requirements specified in **7**.

*Environmental tests for electronic and electrical equipment: Part IV Dry heat test.

†Environmental tests for electronic and electrical equipment: Part II Damp heat (cycling) test.

10.2.4 *Cold (Optional)* — The receiver shall withstand, if required, a cold test of severity −10°C carried out in accordance with IS:2106 (Part III)-1963*.

After the conditioning, the receivers shall be subjected to the recovery under standard atmospheric conditions for testing for a period of two hours. The final measurements as specified in **10.2.6** shall be made. The receiver shall conform to the applicable performance requirements specified in 7.

10.2.5 *Bump* — The receiver complete in its cabinet shall be subjected to bump test in accordance with IS:2106 (Part VII)-1964†. The total number of bumps shall be 4 000 and height of drop shall be 25 mm. The rate of bumping shall be 120 drops per minute.

10.2.5.1 The receiver shall be first examined visually to see if any components are obviously loose, and, if so, the defects shall be rectified. Dial damps, if any, shall be removed and the receiver, mounted in its cabinet, shall be strapped on to the platform of the bump testing machine. The initial measurements as specified in **10.2.1** shall be made on the receiver before mounting it on the machine.

10.2.5.2 After every 100 bumps, up to an initial number of 500 bumps, the machine shall be stopped and the receiver examine visually to check if any components have broken loose. If no damage is observed during first 500 bumps, the machine shall be allowed to make another 500 bumps and a further check on the receiver shall be made. After completion of the bump test, the receiver shall be visually examined and those components that have broken down shall be refixed. Final measurements shall then be made as specified in **10.2.6**.

10.2.6 *Final Measurements* — The following final measurements shall be made after each of the environmental tests specified in **10.2.2** to **10.2.5**, where relevant after recovery:

a) Noise limited sensitivity,

b) Frequency stability, and

c) Maximum useful output power.

The receiver shall conform to the applicable performance requirements specified in 7.

*Environmental tests for electronic and electrical equipment: Part III Cold test.

†Environmental tests for electronic and electrical equipment: Part VII Bump test.

APPENDIX A

(*Clause* 10.1.2.1)

SAMPLING AND CRITERIA FOR CONFORMITY

A-1. LOT

A-1.1 All the receivers of the same frequency range and output impedance from the same batch of manufacture shall constitute a lot.

A-1.1.1 Samples shall be taken and tested to ascertain the conformity of each lot for acceptance tests.

A-2. SCALE OF SAMPLING

A-2.1 Receivers shall be taken at random as per col 1, 2 and 3 of Table 1 (*see* IS:4905-1968*).

TABLE 1 SCALE OF SAMPLING AND CRITERIA FOR CONFORMITY

Lot Size (N)	First Sample (N_1)	Second Sample (N_2)	Combined Sample (N_1+N_2)	Acceptance Number	Rejection Number
(1)	(2)	(3)	(4)	(5)	(6)
Up to 150	5	5	10	0	2
151 to 300	8	8	16	0	2
301 and above	13	13	26	0	2

A-3. NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

A-3.1 Receivers shall be drawn from each lot in accordance with col 1 and 2 of Table 1. If a receiver fails in any one of the acceptance tests, it shall be called a defective. If the number of defectives found in the first sample (*see* col 3) is zero (*see* col 5), the lot shall be considered as conforming to the acceptance tests. If the number of defectives is as equal to or greater than two (*see* col 6), the lot shall be considered as not conforming to the acceptance tests.

A-3.2 If the number of defectives is equal to one, further sample of receivers shall be taken as per col 3 of Table 1 and tested for all the acceptance tests. If the number of defectives in the combined sample (*see* col 4), is less than two (*see* col 6), the lot shall be considered as conforming to the acceptance tests, otherwise rejected.

*Methods for random sampling.

INDIAN STANDARDS
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RADIO AND TELEVISION RECEIVERS

IS

614-1964 Methods of measurement on receivers for amplitude modulation broadcast transmissions (*revised*)

615-1966 Minimum requirements of domestic radio receivers (*revised*)

616-1957 Code of safety requirements for mains-operated radio receivers

1885 Electrotechnical vocabulary:

(Part XVIII)-1967 General terms on radio communications

(Part XXI)-1967 Aerials

(Part XXIV)-1967 Broadcasting sound and television

2032 (Part XVI)-1972 Graphical symbols used in electrotechnology: Part XVI Aerials

2731-1964 Methods of measurements on receivers for frequency modulation broadcast transmissions

3397-1978 Community radio receivers (*first revision*)

4545-1968 Methods of measurement on receivers for monochrome television broadcast transmissions

4546-1968 Methods of measurement of radiations from television receivers

4547-1978 Receivers for monochrome television broadcast transmissions (*first revision*)

6759-1972 Requirements for radio receivers for frequency modulation broadcast transmissions

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TO
IS : 3397 - 1978 SPECIFICATION FOR COMMUNITY RADIO RECEIVERS

(First Revision)

Alterations

(*Page* 3, *clause* **0.2.1**, *line* 3) — Substitute 'solid state devices' *for* 'transistors'.

(*Page* 4, *clause* **1.1**, *line* 1) — Delete the word 'other'.

(*Page* 5, *clause* **4.2.2**, *line* 2) — Substitute '0·916 mm' *for* '1·25 mm'.

(*Page* 6, *clause* **4.3.1**, *line* 1) — Substitute '0·916 mm' *for* '1·25 mm'.

(*Page* 6, *clause* **4.3.2**, *last line*) — Substitute '3·0 mm' *for* '3·2 mm' and '15·0 mm' *for* '19·0 mm'.

[*Page* 7, *clause* **6.1**(a) and **6.1**(c)] — Substitute the following for the existing matter:

'a)

	Rated Voltage	*Operating Voltage*		
		Max	*Nom*	*Min*
	V	V	V	V
Main supply ac	240	250	240	200

Variation in mains supply frequency (50 Hz) shall be within ± 2 percent.

c) Battery cum-mains supply operation.'

(*Page* 7, *Note under clause* **6.1**) — Delete.

(*Page* 7, *clause* **6.1.1**) — Substitute the following for the existing clause:

'**6.1.1** The battery shall be contained within the receiver itself or outside the receiver as may be specified by the purchaser. It shall be possible to replace the battery without dismantling the receiver (if contained within the receiver).

Price Re 1

(*Page* 7, *clause* **7.2.1**, *lines* 2 and 3) — Substitute ' 526 to 1 606·5 kHz ' *for* ' 525 to 1 605 kHz '.

[*Page* 8, *clause* **7.2.2.1**(a)] — Substitute ' 526-1 606·5 kHz ' *for* ' 525-1 605 kHz '.

(*Page* 8, *clause* **7.3**, *last line*) — Substitute ' ± 20 kHz ' *for* ' ± 10 kHz '.

(*Page* 8, *clause* **7.4**, *line* 2) — Substitute ' 459 kHz ' *for* ' 455 kHz '.

(*Page* 8, *clause* **7.5.1**) — Substitute the following for the existing clause:

' **7.5.1** The receiver shall be provided with output impedances of 4 ohms or 8 ohms or 16 ohms. '

(*Page* 9, *clause* **7.8**) — Substitute the following for the existing clause:

' **7.8 Automatic Gain Control Characteristic** — The output of receiver shall not vary by more than 6 dB when the input signal is varied by 30 dB starting from an upper limit of 5 mv. '

(*Page* 9, *clause* **7.14**) — Substitute the following for the existing clause:

' **7.14** The maximum useful output power shall be determined in accordance with **4.13** of IS : 614-1964* and shall be available under condition of operation with maximum ambient temperatures not exceeding 45°C. The value shall be:

a) For mains operated receiver — 2 W, and

b) For battery and battery-cum-mains operated receiver-800 mW, at normal voltage and not less than 400 mW at reduced voltage in case of battery operation: '

(*Page* 10, *clause* **7.15**, *informal table, second column, first entry*) — Substitute ' 23 mA ' *for* ' 230 mA '.

(*Page* 10, *clause* **7.17**) — Delete.

(*Page* 12, *clause* **10.2.2**, *para* 1) — Substitute the following for the existing para:

'The receivers shall withstand the dry heat test of severity 55°C, 16 h, carried out in accordance with IS : 9000(Part III/Sec 5)-1977*. '

(*Page* 12, *clause* **10.2.3**, *para* 1) — Substitute the following for the existing para:

' The receiver shall withstand 2 cycles of damp heat test of severity + 40°C, carried out in accordance with IS : 9000(Part V/Sec 3)†. '

(*Page* 12, *foot-notes with* ' * ' *and* ' † ' *marks*) — Substitute the following for the existing foot-notes:

'*Basic environmental testing procedures for electronic and electrical items: Part II Dry heat test, Section 5 Dry heat test for dissipating items with gradual change of temperature.

†Basic environmental testing procedures for electronic and electrical items: Part V Damp heat (cycle), Section 3 ..... (*under preparation*). '

(*Page* 13, *clause* **10.2.4**, *para* 1) — Substitute the following for the existing para:

' The receiver shall withstand, if required, a cold test of severity —10°C, 16 h, carried out in accordance with IS : 9000(Part II/Sec 4)-1977*. '

(*Page* 13, *clause* **10.2.5**, *para* 1) — Substitute the following for the existing para:

' The receiver complete in cabinet shall be subjected to bump test of severity 4 000 bumps, 400 m/s², carried out in accordance with IS : 9000 (Part VII/Sec 3)-1979†. '

(*Page* 13, *foot-notes with* ' * ' *and* ' † ' *marks*) — Substitute the following for the existing foot-notes:

'*Basic environmental test procedures for electronic and electrical items: Part II Cold test, Section 4 Cold test for heat dissipating items with gradual change of temperature.

†Basic environmental test procedures for electronic and electrical items: Part VII Impact test, Section 3 Drop and topple. '

Addenda

(*Page* 4, *clause* **1.1**, *line* 1) — Add the word ' mechanical ' between ' environmental and electrical '.

(*Page* 5, *clause* **4.2.3**, *line* 2) — Add the words ' both inside and outside ' between ' pre-treatment ' and ' and '.

[*Page* 8, *clause* **7.2.2.1**(b) (1)] — Add the following new note after **7.2.2.1**(b)(1):

' NOTE — This bend will extend up to 9 900 kHz when the final acts of the WARC to be convened for the planning of HF bands allocated to broadcasting service, come into force. '

[*Page* 11, *clause* **10.1.1**(e)] — Add the following new matter after (e):

' f) Environmental tests specified in **10.2.** '

(*Page* 12, *clause* **10.1.2**) — Add the following new clause after 10.1.2:

'**10.1.3** *Routine Tests* — The following shall constitute the routine tests:

a) Visual examination,

b) Maximum useful output power, and

c) Noise limited sensitivity.'

(LTDC 20)

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